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ABSTRACT

This study examined whether utilizing technology in a cooperative learning environment would enhance the academic achievement of Hispanic students who had English as a second language (ESL). Surveys were administered to 30 elementary school teachers. The surveys examined the importance of using technology in the classroom, how the teachers have used technology to assist ESL students, which technological advances were the least and most effective, what technological training was offered to them, and additional comments regarding ESL students and technology. A total of 10 out of the 30 teachers completed the survey. Data analysis indicated that there was a great need for, and support for, using technology in the classroom to assist ESL students. Many teachers needed training because they lacked the technological skills to make this an efficient teaching method for them. Teachers noted a need to know what types of technologies were available for use in their individual classrooms so they could receive the most appropriate training. There appeared to be a shortage of public school funds to provide the necessary equipment and training to teachers and classrooms. Three appendixes include the study's cover letter, the questionnaire, and acknowledgments. (Contains 40 references.) (SM)

Running head: UTILIZATION OF INSTRUCTIONAL TECHNOLOGY

The Utilization of Instructional Technology and Cooperative Learning to Effectively Enhance the Academic Success of Students with English-as-a-Second-Language

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Abstract

"The number of Latino children and youth in public schools in the United States is steadily increasing. Currently, one third of the Latino population is under age 18. Overall, Latino students comprise fifteen percent of K-12 students--a proportion projected to increase to twenty-five percent by 2025" (Office of Educational Research and Improvement, 2001, p. 2). Though the diversity of the United States is an advantage, it still presents an obstacle in the classroom. Currently, traditional educational methods do not have enough flexibility to accommodate students with English-as-a-Second-Language in the regular classroom. As a result, ESL students have difficulty achieving academic success. One method proposed to maximize this opportunity is the utilization of technology in a cooperative learning environment. This research study attempted to examine the effectiveness of instruction through technology, when utilized appropriately, to increase elementary school ESL students' academic achievement. The results indicated that when utilizing technology in the classroom, it must be known what types of technologies are available for utilization in the teacher's individual classroom to thereby train the teachers effectively. Moreover, the digital divide poses a problem when schools are lacking technology due to inadequate funding sources. These results led to many conclusions such as more teacher training being needed to effectively utilize technology, enhanced funds being needed to utilize technology, and utilized technology being a viable success solution for ESL students.

The Utilization of Instructional Technology and Cooperative Learning to Effectively Enhance the Academic Success of Students with English-as-a-Second-Language

> Students at Riverside Elementary School in Princeton, New Jersey, speak 22 different native languages. When the global village moved into our village, one size or approach to technology and learning did not fit at all. During this time of change, I was looking for a way to reach 43 English-as-a-Second Language (ESL) students and help them meet national standards across the curriculum. My quest was to find sensible ways for technology to help me instruct my students. Princeton is a diverse, suburban community of low- to high- income families. Many families come from around the world to study at Princeton University, Princeton Theological Seminary, or the Institute of Advanced Studies. We also have permanent residents who speak several different languages. These families attend our school and contribute to its diversity (Clovis, 1998, p. 52).

The above situation has become a frequently occurring issue for every school system, public and private, in America as we continue to progress into the new millennium. We are currently aware of the increase of immigration into the United States, which constitutes an increase of English-as-a- Second-Language students into our public and private school systems. The Office of Educational Research and Improvement (2001) elucidates this observation by providing statistical accounts such as Latino elementary school enrollment increasing 157 percent between 1978 and 1998. Additionally, Latinos comprise 15 percent of the elementary school-age population. While the

diversification of our nation may seem idealistic, it is also a facet that is causing our school systems to realize that curriculum and instruction in the classroom will have to be dramatically altered in order to be effective and efficient.

Controversy arises when discussing effective instructional methods for ESL students' classroom success. "A major debate among educators is how to best teach non-English speaking students: Should they be taught in their primary language? Should they be encouraged to speak English? Should they receive bilingual education" (Gersten, 1999, p. 41)? Many believe that because immigrant students are moving into an environment where the spoken predominant language is English, they should receive instruction that leads to their eventual development of this language. It is evident that the traditional chalk and talk method will not benefit these students. With this in mind, what effective methods will?

Justification/Importance of Project

According to the U. S. Department of Education (1996), there were and continue to be dramatic changes in the numbers and characteristics of the non-English speaking population. "Language can be a formidable barrier in American society. Interpreting life as a language minority person might do is something most monolingual, English-speaking Americans never contemplate" (McNergney & Herbert, 1998, p. 309).

The American school system has not changed with the changing environmental climate. Though this fact may not affect many students, it definitely crushes the success of ESL students. Latinos especially are lagging despairingly in educational success aspects compared with their major counterparts, African-Americans and whites. Despite the fact that Latinos comprise 15

percent of the elementary school-age population and 13 percent of grades 9-12 school population, the dropout rate is much higher for Latinos than other groups. In 1998, 30 percent of all Latino 16 through 24-years-old (1.5 million) were dropouts, whereas, the dropout rate was 14 percent for African-Americans and 8 percent for whites (Office of Educational Research and Improvement, 2001). Therefore, numerous ESL students are entering the school system, yet the school system is not delivering the expected and needed societal outcome, graduation. This can be attributed to a breakdown of steps in the academic process. According to Office of Educational Research and Improvement (2001), fewer Latinos have access to a computer at home or school, compared with 70 percent of African-Americans and 84 percent of whites. Furthermore, only 18 percent use one at home compared with 19 percent of African-Americans and 52 percent whites. The study also states that only 35 percent of Latino students are enrolled in college preparatory or academic programs that provide access to four-year colleges or rigorous technical schools, as compared with 43 percent of African-Americans and 50 percent of whites. Thereby, the high school completion rate for Latinos is only 63 percent as compared with 81 percent for African-Americans and 90 percent for whites (see Figure 1).

Numerous instructional theories and practices have been developed to assist general classroom teachers with ESL students, however, these students continue to lag behind when compared to African Americans and whites. This research study attempts to examine the effectiveness of instruction through technology, when utilized appropriately, to increase elementary school ESL students' academic achievement. For this study elementary ESL students were chosen due to the reported evidence of disparities between Latino students and others beginning as early as kindergarten (Office of Educational Research and Improvement, 2001).

Hypothesis

The major assumption of this study is that utilizing technology in a cooperative learning environment can enhance academic achievement for ESL students.

Methods

Participants

The major qualifier of all the participants was that they were elementary school teachers. Other than that, there were no other qualifiers because we wanted to get responses from a plethora of backgrounds, age groups, and genders to show opinions and results across multi-spectrums. Ten elementary school teachers volunteered to participate (convenience sampling). All participants taught at the same school but had diverse teaching backgrounds. Volunteers were treated in accordance with the ethical principles of conduct.

Materials

Though numerous methods could be used to collect data, a questionnaire (consisting of multiple-choice items and a ranking scale) was chosen and distributed to the Guilford County school system because it is standardized, objective, efficient, and understandable. Therefore, educators could complete the questionnaire expeditiously. The questionnaire addressed (1) the importance of utilizing technology in the classroom, (2) how teachers have used technology to assist ESL students in the classroom, (3) what technological advances are least and most effective, (4) what technological training is offered, and any additional comments the educators would like to give concerning ESL students and technology. It consisted of 21 multiple-choice questions and one open-ended comment section. Therefore, the data could be quantitatively analyzed while still allowing for qualitative input.

Design and Procedure

The questionnaire was distributed by convenience sampling, but subject characteristics, location, etc. did not pose a threat because the research was designed to gather viewpoints from a plethora of people and situations. In order to gain a valid representative sample, the questionnaire is ongoing. It was given during the summer and will also be given during the 2001-2002 scholastic year when the 65 to 67 schools in the Guilford County system can participate. As a result, an in-depth analysis can be done. For this stage of the study, however, a pilot questionnaire was distributed to one school.

The school was contacted to ask for testing approval. Once the principal agreed to the testing, we presented the questionnaires to the principal with the specified instructions. The instructions were: 1. Distribute to all teaching faculty; 2. Instruct the teaching faculty of the time limit for return and to read all materials thoroughly; 3. Keep the enclosed envelope to gather the questionnaires; 4. Mail to the posted address on the envelope when the questionnaire period has expired.

Scoring

After the answers were recorded/returned, the total size of the sample was calculated along with the overall percentage of returns. Finally, the percentage of respondents who chose each alternative for each question was recorded by tally. These results were organized and analyzed after carefully examining percentage of the responses for trends, etc.

Limitations

1. Due to the limited funding for travel, postage, and printing, questionnaires could only be submitted to elementary school teachers in Guilford County.

2. The questionnaire was distributed proceeding the closing of schools for the summer and also distributed in August which further delayed the analysis. Therefore, only year-round elementary schools were available to complete the questionnaires for the summer portion of the research.
3. Of the 30 questionnaires that were distributed this summer, there were only 10 respondents.

Terminology

1. bilingual education - "classroom instruction in two languages" (Dembo, 1988, p. 504)
2. multicultural education - "a field of study and an emerging discipline whose major discipline is to create equal education opportunities for students from diverse racial, ethnic, social class, and cultural groups. One of its important goals is to help all students acquire the knowledge, attitudes, and skills, needed to interact, negotiate, and communicate with people from diverse groups in order to create a civic and moral community that works for the common good" (Nelson, Palonsky, and Carlson, 2000, p. 254).
3. content area ESOL - structured immersion; process of English language learners beginning their academic instruction in English. Here, teachers modulate their use of English so that it is comprehensible to the student and base their degree of support on their knowledge of that student (Gersten, 1999, p. 43).
4. technology - "electronic or digital products and systems considered as a group" (Lexico LLC, 2001).

5. multimedia - "of or relating to the combined use of several media" (Lexico LLC, 2001).
6. community of practice- "A framework within which individual development and societal transformation are achieved through people working collaboratively with others, both more and less expert than themselves, on questions and problems that arise from practice and are focused on understanding and improving practice"(Wells, 1999, p. 122).
7. cooperative learning- "Interaction with people in the environment to work on a problem together and construct a solution that none could have achieved alone" (Wells, 1999, p. 324).
8. culture- "Composite repertoire created by the interaction, borrowing, imposing, and brokering among its constituent communities of practice" (Wenger, 1998, p. 291).
9. language- "The essential condition of knowing the process by which experiences become knowledge" (Wells, 1999, p. 106).
10. ESL- "English as a Second Language" (Ullman, 1997, p. 1)
11. digital divide- "The separation between those with access to new technologies and those without" (Lonergan, 2000, p. 2).

Theoretical Framework

Sociocultural Theory

To understand the current disparity in the academic success of ESL students and how to address the problem through technology, one must understand the immense importance of the environment (societal and cultural). The environment dictates the activation of learning, language, personal fulfillment, and even intelligence (or what is considered intelligence). As a result, to fully maximize ESL students' success, technology has to implore and utilize the theories,

which entertain the importance of the environment.

Vygotsky, a sociocultural psychologist, highlights two important factors related to how children learn. First, Vygotsky highlights the importance of culture in learning. Vygotsky asserts that culture is the prime determinant of individual development. Humans are the only species to have created culture, and every human child develops in the context of a culture. Therefore, a child's learning is affected in large and small ways by culture. Through culture, children acquire much of the content of their thinking (knowledge). Additionally, the surrounding culture provides a child with the process or means of their thinking; thereby, teaching children what and how to think (On Purpose Association, 1998-2001). With this in mind, technology must in essence embrace one's culture to increase learning. By using one's native language in technological aspects, culture is used to address the learning of ESL students (August & Hakuta, 1997, p. 176).

Second, Vygotsky asserts the importance of language in the cognitive development of young children. Cognitive development results from a dialectical process whereby a child learns through problem solving experiences shared with someone else. The individual's actions and understandings are negotiated by the members of a group (On Purpose Association, 1998-2001). Language is a primary form of interaction through which adults transmit to the child the expanse of the knowledge world. "A creature must be a member of a speech community if it is to have the concept of belief" (Frawley, 1997, p. 92). Therefore, elementary thought is conceived and higher level thought originates through the internalization of external social relationships and meanings (Frawley, 1997, p. 94). This social interaction ultimately addresses the focal point of growth, the zone of proximal development, "the distance between the actual development level as determined

by independent problem solving and the level of potential development as determined by independent problem solving under adult guidance or in collaboration of capable peers" (Schunk, 2000, p. 243). The zone of proximal development is in actuality an essential feature in learning. The individual must engage in joint attention with at least one other person; by discounting their differences and deriving a shared definition of the situation, he/she has prospects of growth (Frawley, 1997, p. 102). As a result, technology must provide the forum for interaction and cooperation to increase learning. It must and will, thereby provide a larger community of interaction and learning through access to students and professionals nationwide.

Experimental Learning Theory

To develop effective technology, one must also understand the importance of active construction and interaction with the environment to unleash learning, characterized by John Dewey's theory of experimental learning. Dewey expresses the belief that "all genuine education comes through experience" (Starnes, 1999, p. 3). John Dewey advocates the learner being the center of experiences. As a result, the human mind is driven to make sense of its world.

Learners, for Dewey, are never passive, neither disinterested spectators of ideas nor idle absorbers of sensations.

> They are always active, implicitly working to reconcile the ancient Greek epistemological conflict-outlined in Reconstruction in Philosophy--between tradition and practice, emotion and reason, doing and thinking. If learners are not always physically interrogating their environments, Dewey says, they are, at least, experimenting with the theories they use to analyze their environments. If they are not always engaged in controlled experiments, employing telescopes and prisms, they are, at least,

squinting, rattling, and thumping. For Dewey, then, learning in natural settings requires interest, effort, and direction (Fishman, & McCarthy, 1998, pp. 21-22).

Thereby, it is ludicrous to believe that one can reach an ESL student by placing the role of passive spectator onto him/her. It is beneficial to know the role of active student learning to implore active student participation in technology. Effective technology must be parallel to an effective teacher by emphasizing "the creation of classroom contexts in which children learn to use, try out, and manipulate language into service of making sense or creating meaning" (August, & Hakuta, 1997, pp. 179-180).

Language as Social Semiotic Theory

The environment influences learning, but it also has an immense affect on the acquisition of language. Therefore, if technology seeks to enhance the language capacity of ESL students, it must encompass the elements of Halliday's theory of language as social semiotic. Halliday's theory identifies language as a human invention used to achieve social living goals (Wells, 1999). It recognizes that an environment is in itself a semiotic construct, yet language is one of the semiotic systems that constitute a culture. Language not only serves to facilitate and support other modes of social action that constitutes its environment but also actively creates an environment of its own. Halliday explains that people should take in the elementary fact that humans talk to each other. Language does not consist of sentences but of text or discourse--the exchange of meanings in interpersonal context (Wells, 1999, pt. II). As a result, for technology to increase language capabilities, it must allow for communication/discourse among individuals through cooperative learning efforts. Consequently, cooperative learning will allow for collaborative problem solving and practice of language.

Hierarchy of Needs

Another aspect, which factors into overall academic achievement is personal fulfillment. One can not achieve academically, if he/she is deficient in personal areas. Environment once again plays a central element in this fulfillment. Abraham Maslow refers to this phenomenon as the hierarchy of needs. Maslow believes all humans have a tendency towards self-actualization and growth when **nurtured by the environment**. The self-actualization process consists of sequential steps one must follow in which the person can not recognize or pursue the next higher need in the hierarchy until his/her currently recognized need is substantially or completely satisfied (prepotency) (Gawel, 1997, p. 3-5) (see Figure 2).

The first four needs are considered deficiency needs or lower order needs, which consist of physiological, safety, love and belongingness, and esteem needs. The term "needs" implies that they have to be met, especially to move unto higher learning and self-actualization. Technology in this stage must eradicate the insufficient satisfying of these needs in order for academic achievement to be fulfilled.

Though ESL students physiological needs, thirst and hunger, are usually met by Title I programs, often their safety (security, stability, protection) and love and belongingness (love and be loved and sense of belonging) needs are unsatisfied. Imagine. These students are entering a different environment, a different culture, in which the language is among one of the many differences they encounter. The students are scared and feel as if they do not belong, such as Rosa (an ESL student). "When Rosa came to the United States from her homeland of Argentina, she was nervous about starting school. She was not comfortable with her English, and she was afraid the other kids would make fun of her" (Claybourne, 2000, p. 6). Therefore, an approach is

needed to help the students feel a sense of belongingness at their own pace. "Technology is the ideal tool to help students like Rosa learn English. Using e-mail, word processors and reading programs, students can be introduced to the English language in a safe, interactive setting where they can learn at their own pace" (Claybourne, 2000, p.6).

If the first three needs are not met, esteem (self-respect, the respect of others) can not be reached. The ESL student will not feel he/she belongs and that his/her culture is valued, so the individual will conversely devalue him/herself. Why is this important to one whose aim is increasing academic success? Self-worth provides the hinges for unleashed academic ability. "The basis for everything we do is self-esteem (self-worth)" (Katz, 1993, p. 2).

> People want to be viewed as able, but failure creates feeling of unworthiness. To preserve a basic sense of self-worth, individuals must feel able and demonstrate that ability often to others. The key is to be perceived as able by others and oneself. Research shows that perceived ability bears a strong positive relationship to students' expectations for success, motivation, and achievement (Schunk, 2000, p. 321).

Consequently, through technology's diversity and compatibility to each individual, deficiency needs can be met to help ESL students ultimately achieve self-actualization (to fulfill one's potentialities). The cooperative element in technology will help the students in the classroom work together for a common goal. Thereby, the students are brought together and have a sense of contribution to a common goal instead of individual competition.

Social Identity Theory

Not only should the personal and learning elements influenced by the environment be examined and utilized, but the environment itself should also be observed to ensure the equality of

ESL students in the classroom so achievement can be obtained. **Social identity theory** relays the results inequality can have in a classroom. According to the element of social identity theory, **minimal identity paradigm**, whenever ingroups and outgroups form, stereotypes, prejudices, and discrimination develop. When mere categorization develops, individuals favor the ingroup (their own group) over the outgroup and discriminate against the outgroup. This phenomenon can occur in situations involving no prior historical conflict and animosity, competition, or physical differences (August, & Hakuta, 1997, pp. 93-94).

> Whenever we are confronted with a situation to which some form of intergroup categorization appears directly relevant, we are likely to act in a manner that discriminates against the outgroup and favors the ingroup. Individuals are likely to evaluate the ingroup more positively than the outgroup and to treat the ingroup more favorably, even when the differences between the groups are minimal, contrived, and insignificant. Language can become the basis for such categorization when some students speak a particular language and others do not (August, & Hakuta, 1997, pp. 93-94).

Therefore, technology must work to minimize the salience of group characteristics by providing experience for heterogeneous group interaction and achievement.

Contact Hypothesis

Williams and Allport's **contact hypothesis** provides the facet technology must comprise in order to tackle the ingroup/outgroup conditions, which may take place between ESL students

and the mainstream population students. The contact hypothesis "explains the conditions that must exist in interaction among different racial and ethnic groups in order for the interaction to result in positive rather than negative attitudes" (August, &Hakuta, 1997, p. 94). There must be equal status, cooperation rather than competition, sanctioning by authorities, and interpersonal interactions to allow people to become acquainted as individuals (August, & Hakuta, 1997, p. 95).

Multiple Intelligences Theory

Technology must also seek to reach the established intelligence area of the ESL students in order to build upon that intelligence. Once again though one must be cognizant of culture. Because all societies value different types of intelligences, the value placed upon the ability to perform certain tasks influences the type of intelligence mastered (Brualdi, 1996, p. 3). Howard's Theory of Multiple Intelligences implies that there are eight intelligences. (See Figure 3) These intelligences are not just specific to the racial majority but to *everyone*.

All of these intelligences are needed to function productively in society. Technology, therefore, must embrace a broader range of talents and skills while offering different advances to engage most or all of the intelligences. By doing this, it will reach the source of learning for ESL students, which it can and will do through different types of programs formulated at the learner's own rate.

Review of Related Literature

Importance/Advantages of Technology in the Classroom

Internet access (and technology in general) is becoming increasingly important for full participation in the economic, political, and social life of the United States. Computers and the

Internet are revolutionizing the ways people learn, communicate, and earn a living. Therefore, the "digital divide"--the separation between those with access to new technologies and those without--is seen by many to be one of this country's leading equity issues (Lonergan, 2000, p. 2). Understanding the direct relationship of success and the widening disparity between those who do and those who do not have access to new technologies, schools have to provide the hands-on usage of the technology to help students acquire the skills needed to be productive contributors to society. The support and action taken to ensure technological usage in the classroom confirm this idea's validity. According to President George Bush, "schools should use technology as a tool to improve academic achievement" (Bush, 2001, p. 22). President Bush is "streamlining duplicative technology programs into a performance-based technology, send(ing) more dollars to schools for technology, and focus(ing) funds on proven means of enhancing education through advanced technology" (Bush, 2001, pp. 22-23). Moreover, the United States Department of Education developed national goals for technology in education such as, (1) all students and teachers having access to information technology, and (2) teachers effectively using technology to help students achieve high academic standards (Department of Public Education, p. 35).

With the evident importance of technology, one must also ask how can technology be effective in the classroom? What is its importance? What are the advantages of using technology in the classroom?

One advantage of some technological elements, such as programmed learning packages, is that they are stand-alone. "Stand-alone programs are completely self-contained in the sense that they do not require the presence or involvement of an on-site teacher" (Monk, 1989, p. 2). Therefore, not only will it "be relatively easy to enlarge curricular offerings," (Monk, 1989, p. 2)

but the teachers individual interaction with students can be increased while students are working independently on the computer.

An area of technology, which fosters benefits is telecommunications (ie. Internet, class talks, phone lines, etc.). Technologies "make it possible to join geographically separated students and teachers" (Monk, 1989, p. 3). This commune "provides students with access to a vast array of information and resources far greater than could ever be provided within the four walls of a classroom, (while) allow(ing) students to retrieve and analyze primary documents" (Department of Education, 2000, p. 29). The information is not only from textbooks and diagrams but also from professionals in the specialty areas. Telecommunications also allows the creation of virtual communities to aid teachers and students. The communities extend education "in places where there is none and extends resources where few exist" (Web-Based Education Commission, 2000, p. 3). The Internet, for example, is making it possible to connect teachers to each other for mentoring, collaboration, and learning (Web-Based Education Commission, 2000). The teachers are now afforded the ability to increase knowledge and strategies to address the individual learner. Participation in the communities "forces the developer (teacher) to rethink curriculum that may be static: it forces the question of how people learn and to further consider the relationship of teaching and learning" (Dial-Driver & Sesso, 2000, p. 2). Students also gain from online communication. According to the study by the Center for Applied Special Technology, online access helps students become more independent, critical, organized, and evaluative, which are qualities needed for success (Department of Education, 2000, p. 23). Students are able to correspond, share, and critique with their peers, thereby, collaborating and structuring a cooperative learning environment. Studies have shown that this same type of collaborative

environment increases the academic success of students, especially African Americans and Mexican Americans--two minority groups facing disparities in the "digital divide" (August & Hakuta, 1997, p. 96).

Ultimately, the numerous types of technology greatly address learning on an individual basis. It provides a means to actively engage the students. "Technology can help to create an active environment in which students not only solve problems, but also find their own problems, which is very different from the typical school classrooms. Technology offers powerful tools for addressing (the school's physical) constraints, from video-based problems and computer simulations to electronic communications systems that connect classrooms with communities of practitioners in science, mathematics, and other fields" (Bransford, Brown, & Cooking, 1999, p. 3). "Writers characterize technology as a tool that can help teachers and students become co-learners who collaboratively construct knowledge. When integrated effectively, digital content enables students to seek and manipulate digital information in collaborative, creative, and engaging ways, all of which fosters learning" (Reed & McNergney, 2000, pp. 2-3). There are a plethora of programs that are able to address all learners and even provide individual tutoring.

Technologies provide a means to understanding higher order problems and difficult subjects ordinarily unreachable to teachers by recognizing the fact that "for many students, the lack of visual representation of many higher-order concepts makes learning them difficult. Teachers have been limited in what they can teach by the tools to which they have access. New technologies allow teachers to teach complex ideas and address intellectual challenges more easily" (Department of Education, 2000, p. 48). To individually address those who have difficulties understanding text, "multimedia resources in real-time through the Internet or stand-

alone software help the students understand the underlying principles" (Department of Education, 2000, p. 27).

Available Technological Advances to Assist ESL Students in the Mainstream Classroom

A review of related literature reveals that there are limited amounts of research that support the prevalence of technology being utilized in the classroom to specifically assist ESL students. However, there are a number of different technological advances that can be utilized to assist these students. These advances include effective use of cameras to learn about background and culture, internet usage for translational research services, e-mail correspondence through keypal programs, and different online and CD-Rom software developed specifically to cater to ESL students.

Using Cameras to Understand Cultural Backgrounds of Students

First, a teacher must understand that in order to be initially effective in instructing ESL students mainstreamed into the classroom, it is important to become knowledgeable of their cultural backgrounds, which will further provide an understanding of their thinking and learning styles. This is to allow the teacher to be able to relate instruction to their students' interests, experiences, values, and beliefs. "As school populations become more diverse, the opportunities educators create to connect home and school culture are critical to student success" (Piazza, 2001, p. 31). The question then is how can teachers, utilizing technology, find out information about their students? Winterville Elementary School, located in the Clarke County School District in Georgia, found a technological solution to this question?

The PHOLKS Project. Piazza (2000), gives a description of a project implemented by the

Winterville Elementary School titled the PhOLKS Project. The PhOLKS Project, developed in 1999 by two University of Georgia researchers, Dr. JoBeth Allen and Dr. Linda Labbo, consists of teachers sending 35 mm cameras home with students to take pictures of home and neighborhood life. After the students have returned the cameras to the teachers and the pictures have been developed, the students can present their pictures to the teacher and/or classmates utilizing either KidPix Studio Deluxe or PowerPoint/Hyperstudio (multimedia presentation software). These types of multimedia presentations can be done on an individual basis or as a class project. Implementation of this project allowed teachers at Winterville Elementary to be able to design classroom practices to accurately match students' needs and thus make for an effective learning experience.

Internet Usage for Translational and Research Purposes

One of the greatest challenges that teachers of ESL students may encounter is developing activities and projects for students who may have mild to severe difficulty with understanding and speaking the English language but are expected to excel in the regular classroom. "When we think about the most effective ways of utilizing technology in the classroom for ESL students, we must keep in mind the results of research studies that indicate the principle that ESL programs must include the development of oral and written proficiency, the development of basic conversational English and academic language, and the systematic proactive teachings of language" (Clovis, 1998, p. 53).

How can technology play a role in this development in ESL students? One of the greatest

tools for teaching and learning is that of the Internet, also known as the "Information Highway." Teachers can use the "Information Highway" in numerous ways to assist ESL students. Several browsers on the World Wide Web allow students to go online and discover information about their topics of interests in their language of choice.

One of the most widely used of these browsers is www.altavista.com. There are no available research articles or text that describe the ability to use this site to conduct online searches in specific languages of choice. Therefore, we document the browser from active experience. Upon logging into the website, you notice that located directly beside the search box is a drop menu entitled "any languages" that allows you to select from 20 different languages. Once you have selected your language of choice, you can type in the topic you are interested in finding information about, and your results will be presented in the language you have selected. This can be very beneficial for teachers because it allows their students to learn and understand topics that are being discussed in the classroom.

Electronic Mail Correspondences through Keypal Programs

In a study involving kindergarteners, Durost and Hutchinson (1997) concluded that "children made new friends via e-mail tasks, which were supplemented by more traditional friend making activities." "E-mail provides chances for learning literacy skills in two ways: (1) students interact socially and (2) they actively use literacy in meaningful ways. E-mail allows students to use language by getting to know their new friends, by obtaining cultural knowledge, and by finding out their own social roles and voices in class discussions" (Tao, & Reinking, 2000, p. 169). They also reported that a closely associated and important aspect of e-mail is that it can create an authentic situation for reading and writing. Such authentic experiences are motivations

for learning important and relevant facts (Baugh & Baugh, 1997).

> A wide variety of learning experiences can be enhanced through e-mail communication. E-mail can bring the outside world into the classrooms. As a result, students can be exposed to other cultures and broaden their perspectives. Communicating with other people, whether they are peers or experts, can be motivating when they are known to be listening and responding to one's e-mail. In addition, e-mail communication can provide students with opportunities for critical thinking and reflection. E-mail can provide students and teachers with the opportunity to become familiar with a mode of communication that is increasingly a part of what it means to be literate. With e-mail communication becoming a popular mode of communication today, e-mail use in classes can be an important part of efforts to prepare our students and teachers for tomorrow (Tao, & Reiking, 2000, p. 165).

Clayborne (2000) reports that research has shown that students learn best when they use the language in context, not just repeating the language. One type of e-mail correspondence program is keypal exchanges using the Internet. Through keypal correspondences, students' messages can be written in the language of the recipient, such as Spanish for a keypal in Chile or French for a keypal in Paris. Students share their stories about their cultures, values, and daily routines. By sharing their personal stories, students not only learn foreign languages, but compose sentences in another language as well. If teachers want to incorporate keypal correspondences in the classroom, they can utilize the following websites:

- Blue Web'n Update (www.kn.packbell.com/wired/bluewebn)
- Kidproj (www.kidlink.org/KIDPROJ)

- Global School Net (www.gsn/project/index/html)
- Teachnet.com (www.teachnet.com
- Intercultural E-mail Classroom Connections (IECC) (www.stolaf.edu/network/iecc)
- SchoolWorld (www.schoolworld.asn.au/projects.html)

Software Designed to Cater specifically to ESL students

Upon searching for available software that are designed to cater specifically to ESL students, there were not many offered. In a software review entitled "Cybershopper for Your Classroom . . . and for Classroom Ideas" (Teaching Pre-K-8, 2000), there was one software package that is described as being a great option for ESL students. The online software is entitled "Alfy: What's it All About?"

> Designed for kids 3-10, this bright, colorful, fully multimedia website draws kids, parents, and teachers into its graphic, icon-based approach to edutainment resources! Audio makes it easy for non-readers, and an option to help ESL students read English. Kids love the "interactive "Brain Train" games, "Storyville tales", and "arcade" activities and "create" virtual art studios that make learning fun (Cybershopper, 2000, p. 34).

There are several other software programs available that are good audio and visual catalysts for assisting English-as-a-Second-Language students' English language acquisition. Clayborne (2000), reports the following software to be beneficial in assisting ESL students in their learning needs:

Aurolog	Tell Me More Pro uses voice recognition software to teach students speech patterns of native speakers.
Berlitz	A source for language instruction, cross cultural training, document translation, and interpretation services.
Curriculum Associates	The watch and listen 15-video series for beginning ESL students emphasizes and reinforces basic vocabulary.

Available Technology Training for Classroom Teachers

Why Technology Training is Important

Technology, as consistently shown, is the element, which our society revolves around. It is becoming increasingly important for each individual to have a practical knowledge of the technologies to be able to function successfully in the work environment. Therefore, elementary school students must grasp technology for them to become technologically adept as adults, and teachers must act as the catalysts for the children's understanding. Technology can also increase and diversify learning. To unlock the doors of technology, teachers must know how to use the technology effectively. They must have the skill and understanding to apply it well. If they do not know how to work with technology or where to go on the Internet to find material of value, the educators do not have real access to what the Internet (technology) can offer (Web-Based Education Commission, 2000, p. 21). As a result, students are ill prepared and in a sense, knowledge deprived because they have not had the opportunity to explore technology.

Common Technology Training for Classroom Teachers and Its Drawbacks

Though numerous theorists have stated the importance of diversified and individual training, most training in the educational arena is too little, too basic, and too generic. For

example, many schools provide after-school technology training sessions. These sessions demonstrate the features of the software applications to all the participants, but the teachers are rarely shown how to use them in the classroom (Reed & McNergney, 2000). Ninety-six percent of teachers surveyed reported that the most common training they received were on basic computer skills. Another national survey found that though 78% of teachers received training during the 1998-1999 school year, the training only lasted 1 to 5 hours for 39% of teachers and 6 to 10 hours for another 19% trained (Web-Based Education Commission, 2000). It is not possible for one to learn anything holistically in that amount of time. They are only able to skim the surface.

Though teachers attend these sessions, most of the software shown is not even available in their classrooms. An estimated 67% of teachers in the NCES survey reported that follow-up or advanced training was available to them (Web-Based Education Commission, 2000). This percentage may seem good, since it is half of the teachers, but if each teacher has at least twenty pupils, think of how many students are not receiving the full benefits of technology.

More than often, teachers are given a teacher's manual and left to decipher what to do with it. Usually there is little help in the schools for clarification. A recent study by the Web-Based Education Commission (2000) found that only 13% of the nation's teachers work in what could be defined as a "high quality technology-supported environment." For most teachers, technical assistance is limited, if available at all.

Though this information may seem dismal, there has actually been an increase in training.

In the 1993-94 school year, only 14% of public school teachers had more than eight hours of training in the area of educational technology, and as many as 50% of teachers had

> little or no experience at all with technology in the classroom. By 1999, one-third of public elementary and secondary school teachers reported feeling well or very well prepared to use computers and the Internet for classroom instruction (Department of Education, 2000, p. 13).

Accordingly, there has been an effort to increase training, but more innovative training must be cultivated into the mainstream training provided.

Innovative Technology Training

It should not be a surprise that the innovative and effective training is actually realized through technology, specifically the Internet. The Internet provides a social structure to cultivate, receive, and express ideas from professionals throughout the world, while also allotting on-line learning programs to accommodate diverse schedules and learners. Through the Internet, teachers have access to professional development opportunities beyond what the local school or district is able to offer. Online courses and seminars, follow-up consultations and mentoring occur without the expense of classroom interruption created by repeated absences for face-to-face-meetings (Department of Education, 2000). Examples of the plethora of programs include TAPPED IN, Inquiry Learning Forum (ILF), Computer Learning Foundation, Course Technology Partners, and others. The Department of Education (2000) reports that TAPPED IN, a program supported by the National Science Foundation, allows teachers to participate in online courses, take their students online, experiment with new ways to teach or conduct research, or participate in community-wide events. The Inquiry Learning Forum extends upon the TAPPED IN program. It is video-centered and web-based. The forum provides opportunities to virtually visit classrooms. The ILF provides help with technology (Department of Education, 2000). Sally

Bowman Alden (2001) provides a computer- learning month every October. The program hosts two national teacher-training competitions. The Course Technology Partners, with the Teacher Education Institute, "offer courses that teach instructors how to integrate technology into the classroom" (Thomas Learning, 2001, p. 1). Courses such as "Teachers Discovering Computers" prove that teachers can be taught. Therefore, teachers are learning in a more cost effective and convenient environment to enhance the quality of learning. "Course Technology" currently offers a suite of products--including instructor-led training courseware (ILT), one-day training manuals, computer-based training (CBT), and more--that train teachers to use technology in the classroom" (Thomas Learning, 2001, p. 1). As a result, teachers' technological needs are met in a variety of ways while allowing them to interact with what they are trying to learn.

Support for Technology Training for Classroom Teachers

When one examines the amount and the kind of technology offered, the individual must look at the allocated funds and programs for the professional development. Support for technology training comes in all forms and levels from federal to local entities. Federally, President Bush and the Department of Education greatly support technological advances for teachers. President Bush has permitted states and local districts to use funding and apply for technological grants, and "according to the U.S. General Accounting Office, there are 28 programs within the Department of Education (2000) that spend a significant portion of their funds on teacher training." The US Department of Education has made $150 million in federal funding available to 352 teacher preparation institutions (Web-Based Education Commission, 2000). Additionally, Congress initiated the Higher Education Act Amendments to ensure teachers are trained by holding higher education institutions accountable for including training in the

effective uses of technology in the classroom.

Locally, school districts vary considerably in the amount of funds allocated to technology training. The amount of money given depends on how much money is being received from the citizens of the community. On an average, the Office of Technology Assessment cited that out of the $4.2 billion that K-12 schools spent on technology in 1996, only 6% was for training. The figure rose slightly in the 1999-2000 year to 17% of the funding going to teacher technology training (Web-Based Education Commission, 2000).

If teachers are not receiving funds from the state, local, or federal avenues, how do they get training? More than often, teachers pay for their own training. For example, OnlineLearning.net, an online continuing education provider, offered over 1,000 courses in the past year. Over 6,000 teachers enrolled in these courses. 85% paid the $450 tuition fee on their own. This means 5,100 teachers had to pay for their own training. Therefore, those teachers who do not have money to access this training will never receive the proper training they need.

Presentation of Results and Analysis of Data

In order to discover what technological training and advances elementary school teachers have been exposed to, the researchers of this study developed a 25-item questionnaire. Thirty (30) questionnaires were submitted as a pilot study to Hampton Elementary School located in Greensboro, North Carolina. Of the thirty questionnaires submitted, there were only 10 respondents. Because the questionnaires were submitted during the summer, they could only be submitted to year-round schools that were open, thereby limiting the access to the target population. Therefore, these 10 respondents will assist in determining how effective this questionnaire serves for research study. It can be determined which questions can be modified to

be more understandable for the respondents. The questionnaires will give more qualitative information related to the research study. After modifications have been made, the questionnaire will be resubmitted to various schools in Guilford County within the 2001-02 academic year.

The first four questions consisted of background information that included the grade levels each individual respondent has taught, their teaching experience, and their licensure areas. Of the 10 respondents, three have taught kindergarten, five have taught first grade, four have taught second grade, four have taught third grade, four have taught fourth grade, six have taught fifth grade, and one has taught sixth grade. In response to teaching experience, six have taught 0 - 3 years, one has taught four to six years, one has taught 14 to 16 years, and one has taught over 22 years. Five of the respondents had their licensures and certifications in Elementary Education (k-6), one in Intermediate Education (4-6), two in B-K, Early Childhood Education, one in Middle School Education (6-8), and one in Art Design.

Below are the instructions, questions, responses, and analysis of the results of this questionnaire:

Part One

Please respond to the following questions by shading the box located in front of the answer of your choice.

1. Of the students you have taught in your years of experience, how many were ESL students?
☐ 0 - 2 ☐ 3 - 4 ☐ 5 - 6 ☐ 7+

Responses:

Seven of the teachers have had 0 - 2 ESL students, two have had 3-4 students, and one has had 7 or more ESL students.

Analysis:

From these results, one can analyze that this research study could very well serve to be effective because teachers are actually being exposed to ESL students in the actual mainstream setting. Due to this, it is important to know if there are advances or assistance provided to teachers to assist them with these students in the classroom. Modifications that should be made to this question is that zero should be a separate choice.

2. How many years of your teaching experience have you had at least one ESL student in your classroom? ☐ **0- 2** ☐ **3- 4** ☐ **5-6** ☐ **7+**

Responses:

All ten of the respondents indicated that they have had at least one ESL student in their classroom for at least 0 - 2 years.

Analysis

This could indicate that there are not many ESL students in elementary school classroom, but because of the limited amount of questionnaires returned, we are unable to make this type of generalization at this time. Some modifications that could be made to this question are that maybe zero should be an option alone, and then the rest of the scale of years should be changed. It would be interesting to know what teachers have had no years of experience in working with ESL students.

3. What ethnicities are/were the ESL students that you teach/taught? (Please check all that apply)

☐ **Hispanic**	☐ **Japanese**	☐ **French**
☐ **African**	☐ **Latin American**	☐ **German**
☐ **Chinese**	☐ **Puerto Rican**	☐ **Other, please indicate:**_____

Responses:

Five of the respondents have taught Hispanic ESL students, one has taught an African ESL student, one has taught a Chinese ESL student, one has taught a Latin American student, one has taught a Puerto Rican ESL student, one has taught a French ESL student. Four respondents have had no experience in teaching ESL students.

Analysis:

These results support that there are various cultures that exist within the mainstream classroom. The majority of students that these teachers have encountered are Hispanic. This supports this study that reports that the Hispanic population will soon become the largest minority in the United States. With these results, it can be analyzed that when developing technological advances to assist ESL students, a variety of languages and cultures should be incorporated. One modification that can be made to this research study is

to exclude Puerto Ricans as a choice, because Puerto Rico is considered to be a Latin American country; therefore, Puerto Ricans are Latin Americans. This will eliminate redundancy.

4. Were you able to communicate effectively with these students in their native language?
☐**Yes** ☐**No**

Responses:

Two responded yes, four responded no, and four did not respond because of their previous responses of lack of experience with ESL students. One teacher questioned what was meant by communicating effectively because communication is there, but to what extent.

Analysis:

Of the respondents who have had experience with ESL students, it appears the majority did not know how to communicate effectively to these students. In response to the questions of what is meant by effective communication is whether the teacher was able to communicate in some manner (verbally or nonverbally) with the ESL student (s) so that the student understood what the teacher was saying to them and was able to reproduce in some manner, different concepts that the teacher was trying to communicate to them.

5. If you were able to communicate effectively with the ESL students, what methods did you use?
☐Verbal/oral (ie. talking or discourse)
☐Gestures (ie. body language and other nonverbal symbols)
☐Written (ie. drawings, words, etc)☞
☐Other, please indicate:_____

Responses:

Five of the respondents have used verbal/oral methods, five have used gestures, two have used written, two have used other methods, and three had no response to this question. Only one of the two that responded other indicated that they have used other students to communicate effectively.
Analysis:

It can be concluded that all of these methods have been used and can be considered as effective. To what extent they have been effective cannot be analyzed though because the questions did not ask for the teachers' input on how it was effective. How did the teachers use verbal/oral to be effectively (by speaking the native language of the student) and how were other students utilized are two additional factors that should be taken into consideration for this question. Also, because technology is a principle focus in this study, visual stimulus utilizing technology can be an additional choice. Some teachers have been able to get their point across better by utilizing technology. Another choice that can be added to the selections is "all of the above".

6. Besides English, what other languages do you speak?
☐ **Spanish** ☐ **Latin** ☐ **Other, please indicate:** _____
☐ **French** ☐ **Japanese** ☐ **Deutsch** ☐ **Chinese**

Responses:

Three of the respondents can speak Spanish, one of the respondents can speak French, one of the respondents can speak Deutsch, and one respondent indicated sign language as another choice. The remaining respondents indicated that they spoke no other languages.

Analysis:

These results indicate that some teachers are prepared to handle certain ESL students in the classroom because they have acquired another language. There is no better way to assist ESL students than to have knowledge of their language and being able to communicate to them in their language. This could indicate that within teacher education program, maybe teachers should be required to minor in foreign language in order to assist the growing diversity of students entering the classroom. In modifying this question, "none of the above" should be a selection.

7. Check off the technologies that are available within your classroom.

- ☐ **Computers (How many _____)**
- ☐ **Internet Access**
- ☐ **E-mail Capabilities**
- ☐ **Tape Recorders**
- ☐ **Video/digital cameras**
- ☐ **TV/VCR**
- ☐ **Electronic translators**
- ☐ **Other, please indicate:_____**

Responses:

Nine of the respondents indicated that there were computers in their classroom. Of these nine, three had two computers, three had four computers, and three had five computers. Four of the respondents indicated that they had Internet access, three have e-mail capabilities, six have tape recorders, none have digital cameras, four have tv/vcr's and no one indicated that they had electronic translators or any other types of technology in the classroom.

Analysis:

It is good to know that the majority of respondents have at least one computer in their classroom. This indicates that teachers are having some access to technology to assist them in the instructional process. But, there are a limited number of computers in each classroom. How can this limited amount of computers in the classroom benefit the class as a whole?. This is where cooperative learning should take place. Teachers have to be trained on how to utilize the technology that they have to benefit all of the students. Where there is a computer, there is at least the possibility of having Internet access and e-mail capabilities. Because of limited amount of computers, other technologies that can be used in a cooperative learning format are those of the tape recorders and the tv/vcr's. There are even limited amount of these for classroom usage. Research is currently being conducted on lack of technology in classrooms and homes, which is described as the digital divide. What can be done to solve a problem like this? How can teachers be trained to use what they have in an effective and efficient manner.

8. Name at least three (3) workshops/seminars/conferences you have attended that focused mainly on using technology in the classroom to assist ESL students?

(1)	**(4)**
(2)	**(5)**
(3)	**(6)**

Responses:

None of the teachers responded that they have attended any workshops that focused specifically on utilizing technology to assist ESL students in the classroom.

Analysis:

It can be concluded from this result that teachers are not receiving the training that they need to assist ESL students in the mainstream classroom through the utilization of technology. We can use this information to conclude what types funding can be provided to train teachers in utilizing technology in this manner.

9. Who provided the funding to attend the workshops/seminars/conferences?

☐Local school district ☐State or local grants ☐Federal funds
☐Self funding ☐Other, please indicate:_____

Responses:

Because none of the teachers have had this specific type of training, there were no workshops, seminars, or conferences to be funded relating to this matter.

Analysis:

Further research should be done to see if workshops, seminars, or programs of this type are being conducted and how they are being funded.

10. How well did the workshops prepare you to utilize technology in the classroom?

☐Well prepared ☐Somewhat prepared ☐Not prepared at all

Response:

The respondents attended no workshops of this type, therefore no responses were given to this question.

Analysis:

The researchers could possibly develop a workshop or seminar that deal with this lack of knowledge that teachers have about using technology to assist ESL students.

11. If technology is to be incorporated into the mainstream classroom, what percentage of classroom curriculum and instruction (using approximation) should be technological?

☐100% ☐75% ☐50% ☐25%

Responses:

Four of the respondents indicated 25%, five of the respondents indicated 50%, one respondent indicated 75%, and none of the respondents indicated 100%.

Analysis:

This result indicates that these teachers feel that technology, overall should not be a great method of assisting students in the mainstream classroom. They are indicating this maybe because they do not understand technology and how important its utilization can be in assisting ESL students. After these teachers have received training and have developed skills in technology, maybe their opinions on how much technology can be used will change.

12. How many changes will need to be made school wide to incorporate the needed technology?
☐Many ☐Few ☐None ☐Depends on the school system

Responses:

Two of the respondents indicated that many changes will have to be made and the remaining eight indicates that it will depend on the school system.

Analysis:

This result indicates that the teachers understand that depending on the school system (its financial status) will depend on how many changes can be made. It can be assumed that if the school system is proficiently wealthy, they can provide whatever is needed to incorporate a sufficient amount of technology in their schools and vice-versa.

13. In your professional opinion, approximately what percentage of teachers will need to attain additional training to incorporate technology into the classroom?
☐100% ☐75% ☐50% ☐25%

Responses:

One respondent indicated that 100% of teachers will need additional training, five indicated that 75% of teachers will need training, two indicated that 50% of the teachers will need training, and two indicated that 25% of teachers will need additional training.

Analysis:

This will indicate that the teachers realize that teachers are not as proficient in technology as they could be and probably could not handle a lot of technology usage in the classroom due to lack of skills and

experience with technology. If teachers do not understand technology, then they cannot understand how it can be used to assist them in effectively instructing all students in the mainstream classroom.

14. Utilizing your professional experience, do you feel technology will be a holistically viable approach to assisting ESL students' learning? ☐Yes ☐No

Response:

Eight of the respondents indicated yes, the remaining two indicated no.

Analysis:

The majority of the teachers feel that technology can definitely assist in the teaching and learning process. The two teachers that indicated no, may not be proficient in their technological skills and see this as a personal drawback within their classrooms.

Part Two

Please respond to the following statements using a four-point scale where "1" indicates most desirable/highest while "4" indicates least desirable/lowest.

Key: ***Most Desirable/highest= 1, Desirable/high=2, Undesirable/low=3, Least Desirable/lowest=4***

15. Rank your utilization of these technologies in your instruction.

Computers (How many _____)	☐ 1	☐2	☐3	☐4
Video/digital cameras	☐ 1	☐2	☐3	☐4
Internet Access	☐ 1	☐2	☐3	☐4
TV/VCR	☐ 1	☐2	☐3	☐4
E-mail Capabilities	☐ 1	☐2	☐3	☐4
Electronic translators	☐ 1	☐2	☐3	☐4
Tape Recorders	☐ 1	☐2	☐3	☐4
Other, please indicate:_____	☐ 1	☐2	☐3	☐4

Responses:

For computers, four indicated the computer as most desirable, five indicated it as just desirable, and one indicated it as undesirable/low. For video/digital camera, four indicated desirable/high, one indicated undesirable/low, and three indicated least desirable/lowest. For Internet Access, two indicated most desirable/highest, five indicated desirable/high, two indicated undesirable/low, and one indicated least desirable/lowest. For tv/vcr, two indicated most desirable/high, five indicated desirable/high, one indicated undesirable/low, and four indicated least desirable/lowest. For e-mail capabilities, three indicated most desirable/highest, two indicated desirable/high, and one indicated undesirable/low. For Electronic translators, two of the respondents indicated most desirable/highest, three of the respondents indicated desirable/high, and two of the respondents indicated least desirable/lowest. For tape recorders, four of the respondents indicated most desirable/highest, two of the respondents indicated desirable/high, and two of the respondents indicated least desirable/lowest. No other technologies were indicated.

Analysis:

One can conclude here that for the majority of technologies mentioned, the computer in general and the utilization of tv/vcr is most desirable to utilize in the classroom. The other technologies may not be as desirable because they are not as attainable or available in the classroom or teachers do not utilize them as much because of lack of proficiency in effectively using them.

16. How would you rank the current educational approaches used to engender academic success for English-as-a-Second Language students?

☐ 1 ☐2 ☐3 ☐4

Respondents:

Two of the respondents indicated high (2), Seven of the respondents indicated low (3), and one of the respondents indicated lowest (4).

Analysis:

It is obvious that there is not enough being done to assist the teachers in effective instructing ESL students in the classroom. Therefore, continuous research of different methodologies (technology-related) would need to take place to discover ways that teachers can be assisted.

17. Considering the types of technological advances listed below, how effective do you believe each is or will be for increasing the academic achievement of ESL students?

Key pal correspondence **(ie. e-mail correspondence between students)**	☐ 1	☐2	☐3	☐4
CD-ROM **(ie. learning software & computer simulations)**	☐ 1	☐2	☐3	☐4
Internet usage **(ie. research sites, virtual field trips, & translation devices)**	☐ 1	☐2	☐3	☐4

Responses:

For keypal correspondences, one of the teachers indicated highest, seven of the respondents indicated high, one of the respondents indicated low, and one respondent indicated lowest. For CD-roms, six of the respondents indicated highest, two of the respondents indicated high, one of the respondents indicated low, and one of the respondents indicated lowest. For Internet Usage, five of the respondents indicated highest, three of the respondents indicated high, one of the respondents indicated low, and one of the respondents indicated lowest.

Analysis:

Overall, it can be assumed from these results that the majority of the respondents believe that these types of technological advances will definitely be effective in the classroom. The disadvantage of this is the digital

divide, which may not allow all teachers to have access to this type of technology. For the teachers who can have access, lack of proper training for effective use could be another disadvantage.

18. Examining the curricular subjects below, how well will each benefit from technological devices?

Mathematics	☐ 1	☐2	☐3	☐4
Social Studies	☐ 1	☐2	☐3	☐4
Language Arts	☐ 1	☐2	☐3	☐4
Science	☐ 1	☐2	☐3	☐4

Responses:

For math, seven indicated highest, two indicated high, one indicated low, and one indicated lowest. For social studies, five indicated highest, four indicated high, and one indicated lowest. For Language Arts, four indicated highest, two indicated high, and three indicated low. For Science, four indicated highest and the remaining indicated high.

Analysis:

From these rankings, it can be concluded that these teachers believe that technology can benefit all subjects. Therefore, when teachers do receive training for utilizing technology, all of these subjects should be covered in training.

19. Technology can be used in a variety of practices in the mainstream classroom. What level of success in increasing ESL students' academic achievement will each have when technology is incorporated?

Direct instruction	☐ 1	☐2	☐3	☐4
Group projects	☐ 1	☐2	☐3	☐4
Supplemental activities	☐ 1	☐2	☐3	☐4
Study tool	☐ 1	☐2	☐3	☐4
Research tool	☐ 1	☐2	☐3	☐4

Responses:

For direct instruction, five indicated highest, five indicated high, and one indicated low. For group projects, four indicated highest, five indicated high, and two indicated low. For supplemental activities, five indicated highest, four indicated high, and four indicated lowest. For study tools, five indicated highest and five indicated high. For research tool, five indicated highest and five indicated high.

Analysis:

From these results, it appears as though technology can be used effectively in a variety of ways. In this study, it is indicated that it should be used in a cooperative learning format to be fully effective within the classroom. By the teachers indicating high and highest for group instruction, this supports the theoretical

framework of this study to a high extent.

20. How would you rank the impact technology can have on ESL students' scholastic achievement? ☐1 ☐2 ☐3 ☐4

Responses:

Five of the respondents indicated highest, three of the respondents indicated high, and two of the respondents indicated low.

Analysis:

The result show that the teachers believe that technology has, is, and will continue to benefit ESL students greatly in the mainstream classroom, especially if utilized effectively.

21. How would you rank the cost effectiveness of technological advances in the school?
☐1 ☐2 ☐3 ☐4

Responses:

One of the respondents indicated highest, five of the respondents indicated high, and the remaining four indicated low.

Analysis:

The majority of the respondents concluded that there would be a high cost-effectiveness for utilizing technology in the classroom. The question of where to obtain funds from to assist in bringing more technology into the classroom becomes an issue as discussed in the review of related literature of this study.

What other issues do you feel must be examined to improve the academic achievement in the mainstream classroom for English as a Second Language Students?

Of the ten respondents, only two gave additional information regarding ESL students and academically assisting them in the classroom. One of the respondents indicated that the "time factor" is an important facet to take into consideration (how much time is taken away from other students). This is important to take into consideration when trying to incorporate technology in the classroom for ESL students. What must be realized though is that technology can be used as a tool that can help teachers produce instruction in a timely manner. This can be done mostly through the methods described in the theoretical framework that supports cooperative learning. Technology is not going to take the place of the teacher, but rather it will facilitate to make learning an easier process for the ESL students, so as to not have to focus more time giving them one on one instruction, but rather instructing the class as a whole. This helps ESL students to blend in to the mainstream setting.

Another respondent commented that human resources are needed to train teachers who have ESL students and that this would be to assist with parent conferences as well. This study focuses on how teachers can be trained to assist ESL students in the classroom utilizing technology and shows that there is a great need for this.

Overall, the results of this questionnaire indicate that there is a great need and support for technology in the classroom to assist ESL students. Many teachers have a lack of technological skills that make this an efficient methodology for them and therefore much training is needed to assist them. At the same time, the digital divide may cause a lack of different technologies in the classroom due to shortage of funds in a public school system. An additional question that can be added to our research is if there are any technologies that the teachers have used to assist an ESL student and how effective was it in aiding them in understanding the concept(s) being taught.

Conclusions and Recommendations

When discussing the utilization of technology in the classroom, there must be an understanding that before considering what types of technologies teachers should be trained to utilize, it must be known what types of technologies are available for utilization in their individual classroom. The digital divide poses a problem when schools cannot be provided with sufficient amounts of technology due to lack of funding.

Additionally, technology is a viable resource for all students. Though this is known and software is readily available, ESL students are still not excelling. This leads to the assumption that academic success does not depend on the amount of technology available. Teachers must be able to utilize technology effectively and be exposed to the necessary training for technology to actually increase ESL students' success.

The following recommendations for this research study include the following:

1. Teacher Training

    a. development of software programs that can be used as a training tool to assist teachers in utilizing different technologies to assist ESL students.

    b. there should be an increase in funding from federal or local agencies for training

    c. additional assistance and interval upgrades should be provided

    d. teacher education programs' curriculums need to provide more hands-on technology experience

2. Research is needed to focus on the other age groups of ESL students to see if age plays a factor in the increased academic success achieved through technology.
3. Research is needed to examine the disadvantages of technology to examine the issue more thoroughly.
4. Research is needed to examine other methods that can be used in conjunction with technology in the classroom.
5. Research is needed to examine other environments where technology can be effective.
6. Research is needed to examine the cultural backgrounds (i.e. prerequisite knowledge) to see if it plays a role in the academic success regardless of teaching methodologies used.

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Figure Captions

Figure 1. Disparity factors in the academic success of ESL students

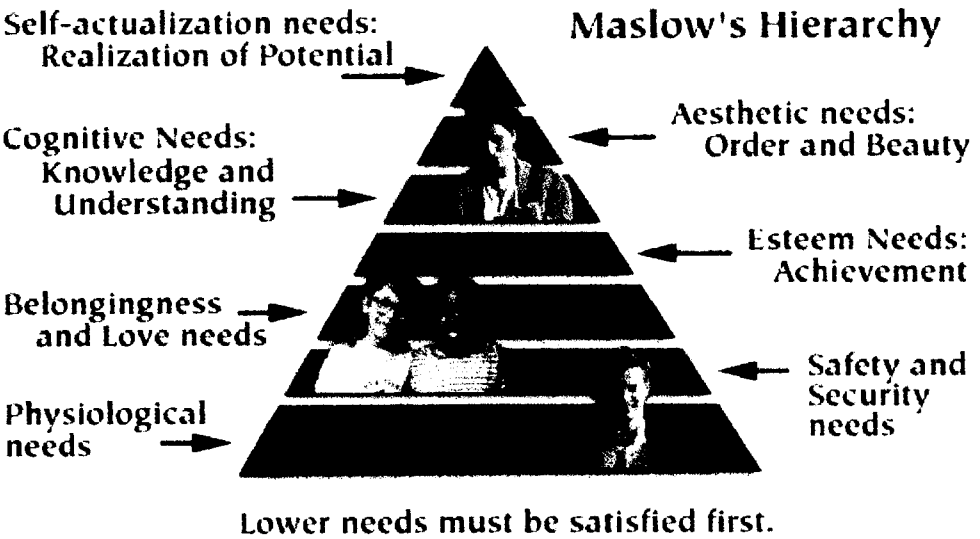
Figure 2. Maslow's hierarchy of needs

Figure 3. Howard Gardner's multiple intelligences

Howard Gardner's Multiple Intelligences Theory

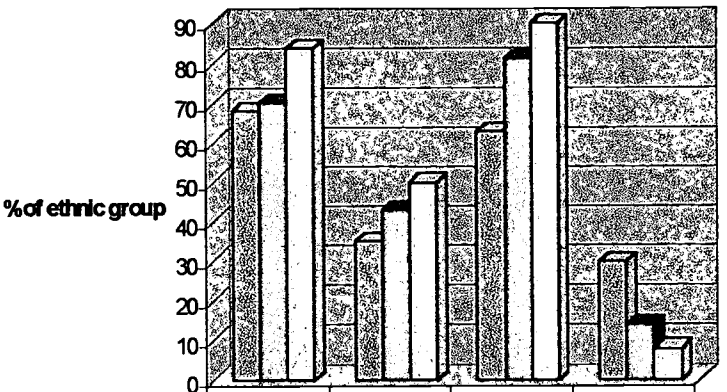
Types of Intelligences	Description
Logical Mathematical	ability to detect patterns, reason deductively, and think logically
Linguistic	ability to effectively manipulate language to express oneself rhetorically or poetically
Spatial	ability to manipulate and created mental images in order to solve problems
Musical	capability to recognize and compose musical pitches, tones, and rhythms
Bodily-kinesthetic	ability to use one's mental abilities to coordinate one's own movements
Interpersonal	ability to understand the feelings and intentions of others
Intrapersonal	ability to understand one's own feelings and motivations
Naturalistic	ability to understand nature and its elements

(Brualdi, 1996, pp. 2-3)



(B. Caldwell, D. Drake, M. Safly, & L. Ulch, 1999)

Disparity Factors in the Academic Success of ESL Students



	Computer Usage	College Prep Enrollment	High School Completion	Dropout Rate
Latinos	68	35	63	30
African-Americans	70	43	81	14
Whites	84	50	90	8

factors of academic success

Appendix A: Cover Letter

July 25, 2001

Dear Prospective Participant:

We, Shandua Brown and Teketa Mitchell, Instructional Technology graduate students, are currently involved in conducting a scholarly research study in accordance with the Ronald E. McNair Undergraduate Post-Baccalaureate Achievement Program at North Carolina A & T State University. The study seeks to explore how the utilization of technology in a cooperative learning environment will increase elementary school English as a Second Language students academic achievement in the mainstream classroom. We are interested in recognizing the available technological advances and training and the uses of the technology in order to create a technological program to encompass ESL students. Aiding in our research are our mentor, Dr. Treana Adkins-Bowling, Coordinator, Elementary Education Program at NC A & T SU and Ms. Ruby Reid, Director, Ronald E. McNair Program.

We are seeking approximately 100 elementary school teachers to take part in this research study. Your involvement in the study includes completing the enclosed questionnaire related to technological advances available to assist ESL students in the mainstream classroom. Completion of the questionnaire should take no longer than ten minutes. Please place the completed questionnaire in the enclosed envelope, and return it to us by **July 31, 2001** for analyzation.

Your participation in this study is voluntary. **All** information received is strictly confidential and will be used only in a group summary, not on an individual basis. A summary of findings will be made available upon your request through e-mail or by phone.

We would like to thank you in advance for taking the time to complete this questionnaire. If you have any questions or comments regarding the study, please feel free to contact Shandua Brown at (336) 856-9803 or shandua@hotmail.com and/or Teketa Mitchell (252) 757-0665 or tm980719@ncat.edu.

Sincerely,

Shandua Brown, MS Graduate Student, North Carolina A&T State University

Teketa Mitchell, MS Graduate Student, North Carolina A&T State University

Enclosure

Appendix B: Questionnaire

The Utilization of Instructional Technology and Cooperative Learning to Enhance the Academic Success of Students with English as a Second Language in the Mainstream Classroom

Shandua Brown and Teketa L. Mitchell
North Carolina Agricultural and Technical State University
Ronald E. McNair Post-Baccalaureate Undergraduate Program

"The number of Latino children and youth in public schools in the United States is steadily increasing. Currently, one third of the Latino population is under age 18. Latino students comprise fifteen percent of K-12 students overall, a proportion projected to increase to twenty-five percent by 2025" (Office of Educational Research and Improvement, 2001, p. 2). Though the diversity of the United States is an advantage, it still presents an obstacle in the classroom. Currently, traditional educational methods do not have enough flexibility to accommodate English as a Second Language students in the regular class. As a result, ESL students have difficulty achieving academic success. One method proposed to maximize this opportunity is the utilization of technology in a cooperative learning environment.

In gathering quantitative, as well as qualitative information about technological advances for ESL students, it will greatly help if you would fill out the following questionnaire. Your opinions concerning this research study are extremely valuable and important. Therefore, it is necessary to answer each question completely. All information recorded on this questionnaire will be confidential and only used as a means of quantitative data. In advance, we thank you for taking the time to complete this questionnaire.

School Name:_____

Grade Level(s) Taught:_____ Teaching Experience: _____yrs
Licensure Area(s):

Part One
Please respond to the following questions by shading the box located in front of the answer of your choice.

1. Of the students you have taught in your years of experience, how many were ESL students?
   ☐ 0 - 2 ☐ 3 - 4 ☐ 5 - 6 ☐ 7+

2. How many years of your teaching experience have you had at least one ESL student in your classroom?
   ☐0- 2 ☐ 3- 4 ☐5-6 ☐7+

3. What ethnicities are/were the ESL students that you teach/taught? (Please check all that apply)

☐ Hispanic	☐ Japanese	☐ French
☐ African	☐ Latin American	☐ German
☐ Chinese	☐ Puerto Rican	☐ Other, please indicate:_____

4. Were you able to communicate effectively with these students in their native language?
☐Yes ☐No

5. If you were able to communicate effectively with the ESL students, what methods did you use?
☐Verbal/oral (ie. talking or discourse)
☐Gestures (ie. body language and other nonverbal symbols)
☐Written (ie. drawings, words, etc)
☐Other, please indicate:_____

6. Besides English, what other languages do you speak?
☐ Spanish ☐ Latin ☐ Other, please indicate: _____
☐ French ☐ Japanese
☐ Deutsch ☐ Chinese

7. Check off the technologies that are available within your classroom.
☐ Computers (How many _____) ☐ Video/digital cameras
☐ Internet Access ☐ TV/VCR
☐ E-mail Capabilities ☐ Electronic translators
☐ Tape Recorders ☐Other, please indicate:_____

8. Name at least three (3) workshops/seminars/conferences you have attended that focused mainly on using technology in the classroom to assist ESL students?
(1) (4)
(2) (5)
(3) (6)

9. Who provided the funding to attend the workshops/seminars/conferences?
☐Local school district ☐State or local grants ☐Federal funds
☐Self funding ☐Other, please indicate:_____

10. How well did the workshops prepare you to utilize technology in the classroom?
☐Well prepared ☐Somewhat prepared ☐Not prepared at all

11. If technology is to be incorporated into the mainstream classroom, what percentage of classroom curriculum and instruction (using approximation) should be technological?
☐100% ☐75% ☐50% ☐25%

12. How many changes will need to be made school wide to incorporate the needed technology?
☐Many ☐Few ☐None ☐Depends on the school system

13. In your professional opinion, approximately what percentage of teachers will need to attain additional training to incorporate technology into the classroom?
☐100% ☐75% ☐50% ☐25%

14. Utilizing your professional experience, do you feel technology will be a holistically viable approach to assisting ESL students' learning?

☐Yes ☐No

Part Two

Please respond to the following statements using a four-point scale where "1" indicates most desirable/highest while "4" indicates least desirable/lowest.

Key: Most Desirable/highest= 1, Desirable/high=2, Undesirable/low=3, Least Desirable/lowest=4

15. Rank your utilization of these technologies in your instruction.

Computers (How many _____)	☐ 1	☐2	☐3	☐4
Video/digital cameras	☐ 1	☐2	☐3	☐4
Internet Access	☐ 1	☐2	☐3	☐4
TV/VCR	☐ 1	☐2	☐3	☐4
E-mail Capabilities	☐ 1	☐2	☐3	☐4
Electronic translators	☐ 1	☐2	☐3	☐4
Tape Recorders	☐ 1	☐2	☐3	☐4
Other, please indicate:_____	☐ 1	☐2	☐3	☐4

16. How would you rank the current educational approaches used to engender academic success for English-as-a-Second Language students?

☐ 1 ☐2 ☐3 ☐4

17. Considering the types of technological advances listed below, **how effective** do you believe each is or will be for increasing the academic achievement of ESL students?

Key pal correspondence (ie. e-mail correspondence between students)	☐ 1	☐2	☐3	☐4
CD-ROM (ie. learning software & computer simulations)	☐ 1	☐2	☐3	☐4
Internet usage (ie. research sites, virtual field trips, & translation devices)	☐ 1	☐2	☐3	☐4

18. Examining the curricular subjects below, how well will each benefit from technological devices?

Mathematics	☐ 1	☐2	☐3	☐4
Social Studies	☐ 1	☐2	☐3	☐4
Language Arts	☐ 1	☐2	☐3	☐4
Science	☐ 1	☐2	☐3	☐4

19. Technology can be used in a variety of practices in the mainstream classroom. What level of success in increasing ESL students' academic achievement will each have when technology is incorporated?

Direct instruction	☐ 1	☐2	☐3	☐4
Group projects	☐ 1	☐2	☐3	☐4
Supplemental activities	☐ 1	☐2	☐3	☐4
Study tool	☐ 1	☐2	☐3	☐4
Research tool	☐ 1	☐2	☐3	☐4

20. How would you rank the impact technology can have on ESL students' scholastic achievement?

☐1 ☐2 ☐3 ☐4

21. How would you rank the cost effectiveness of technological advances in the school?

☐1 ☐2 ☐3 ☐4

What other issues do you feel must be examined to improve the academic achievement in the mainstream classroom for English as a Second Language Students?

Appendix C: Acknowledgements

First of all, we, Shandua Brown and Teketa L. Mitchell, would like to extend our sincere gratitude to Mrs. Rubye E. Reid, McNair program director, as well as the other McNair staff, Ms. Marie Chapman and Mrs. Geraldine Burnett, for allowing us to participate in the 2001 summer research internship. Furthermore, we would like to thank Dr. Treana Adkins-Bowling for her unyielding patience, scholarly advice, and understanding. Lastly, we thank the authors of the literature we utilized for articulating their research and thoughts in written form.

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Organization/Address: NC A&T State University, 1601 E. Market Street, Greensboro, NC 27411	Telephone: (252) 757-0665 FAX: —
	E-Mail Address: fm980179@ncat.edu Date: 11/13/01

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CLEARINGHOUSE ON TEACHING
AND TEACHER EDUCATION

June 6, 2001

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The ERIC Clearinghouse on Teaching and Teacher Education invites you to contribute to the ERIC database by providing us with a copy of your paper that will be presented at the *43rd Biennial Convocation,* (Orlando, FL, November 8 - 10, 2001). Abstracts of documents that are accepted by ERIC appear in the print volume, *Resources in Education* (RIE), and are available through computers in both on-line and CD/ROM versions. The ERIC database is accessed worldwide and is used by teachers, administrators, researchers, students, policymakers, and others with an interest in education.

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Should you have further questions, please contact me at 1-800-822-9229; or E-mail: lkelly@aacte.org.

Sincerely,

Linda M. Kelly

Linda M. Kelly
Acquisitions and Outreach Coordinator

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November 12, 2001

ERIC Clearinghouse on Teacher and Teacher Education
1307 New York Avenue; NW Suite 300
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ERIC Clearinghouse on Teacher and Teacher Education:

I am enclosing a submission to the ERIC database entitled, "The Utilization of Instructional Technology and Cooperative Learning to Effectively Enhance the Academic Success of Students with English-as-a-Second-Language." The manuscript is 53 pages long and includes 3 figures.

Portions of this data were previously presented at the Kappa Delta Pi 43rd Biennial Convocation in Orlando, Florida on November 8, 2001. There are no other articles pertaining to this subject, in which we have published. My coauthors and I do not have influencing interests in the research, and APA ethical standards were followed.

I will be serving as the corresponding author for this manuscript. All authors listed in the byline have agreed to the byline order (alphabetical listing). I am responsible for maintaining correspondence with the editorial committee and the coauthors. There is an understanding that, if accepted for publication, a certification of authorship form will be required that all coauthors will sign.

Sincerely,

Teketa L. Mitchell

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